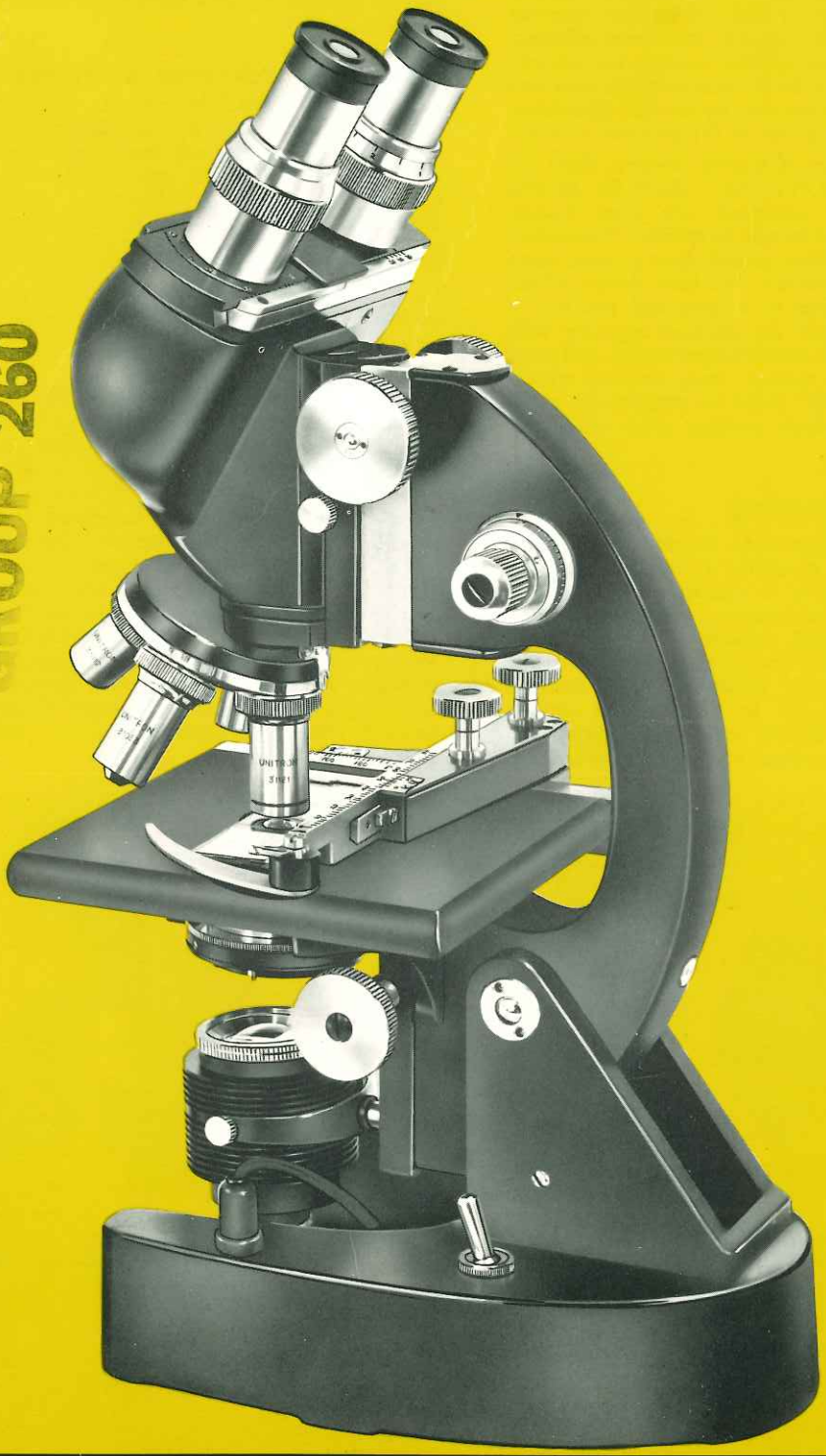
UNITRON

— "ML" SERIES —

PUBL 359-377

LABORATORY AND MEDICAL MICROSCOPES

RECEIVED
OCT 8 - 1965
GROUP 260



BINOCULAR OR MONOCULAR EYEPIECE SYSTEM

STANDARD OR AUTO-ILLUMINATION BASE

WIDEFIELD, HUYGENS, OR ZOOM EYEPIECES

359/377

UNITRON INSTRUMENT CO. MICROSCOPE SALES DIVISION 66 NEEDHAM STREET, NEWTON HIGHLANDS 61, MASS.

UNITRON PROVEN MICROSCOPES for the

● CLASSICAL, TIME-TESTED DESIGN

To meet the requirements of advanced research, microscope designers have developed a variety of stands, many of which differ in appearance from the familiar laboratory microscope. In one such stand in current use, the ability to incline the microscope has been abandoned in favor of an eyepiece tube set at a fixed angle. Some manufacturers have adopted the basic design of this research type of stand for all of their biological models, with a simplified version offered for routine use.

There is, however, good reason to prefer the inclinable "classical" design — as used by UNITRON in its "ML" Series — when choosing a microscope for general laboratory and medical use. It is the only type of stand now being made which each user can easily adjust to the posture that he, himself, finds most relaxing. For prolonged observation, comfort is not a luxury. Anyone who has experienced the fatigue caused by strained neck muscles and shoulders arched in an unnatural manner knows that discomfort detracts from the ability to concentrate on the problem at hand.

Aside from the important question of healthy posture, there are other reasons to prefer UNITRON's "ML" stand for general laboratory use. It is completely equipped with every feature needed for general microscopy, yet is easy to operate. Time-tested construction, perfected by experience gained during many years of use, insures trouble-free performance. The basic design, which allows the arm to be inclined even to a horizontal position, is sufficiently versatile to adapt easily for photomicrography with any type of camera, and is ideally suited for projection and work with a camera lucida. For these reasons, many medical schools specifically favor UNITRON's "ML" stand for student use rather than the non-inclinable types which perhaps prove of greater value in more specialized work.

● FOR A VARIETY OF APPLICATIONS

The UNITRON Series "ML" Microscopes are recommended for general laboratory use in work requiring a complete range of magnification: low power scanning to examinations under oil immersion. School biological laboratories, medical students, school of nursing, and the hospital, clinical, and public health labs have found these foolproof instruments more than meet their requirements. There are also many industrial applications in testing and quality control. To aid in these special studies, a full range of accessories are offered, including counting and measuring reticles, micrometer eyepieces, darkfield condenser, etc.

● CHOICE OF SEVERAL MODELS

Several models are available to suit individual tastes and budgets. Binocular instruments are more restful on the eyes for prolonged work and have other additional features not found on the monocular types. The AUTO-ILLUMINATION Models offer the advantage of optimum lighting for highest resolution, without any special attention or care by the user. STANDARD Models, with plano-concave mirror, are available for those who already have a suitable light source or who wish to use a specialized external illuminator as needed, for example, in fluorescence microscopy. A PORTABLE Model is also offered for those who find compactness of special importance. Optical combinations can be selected to meet the requirements of individual medical schools.

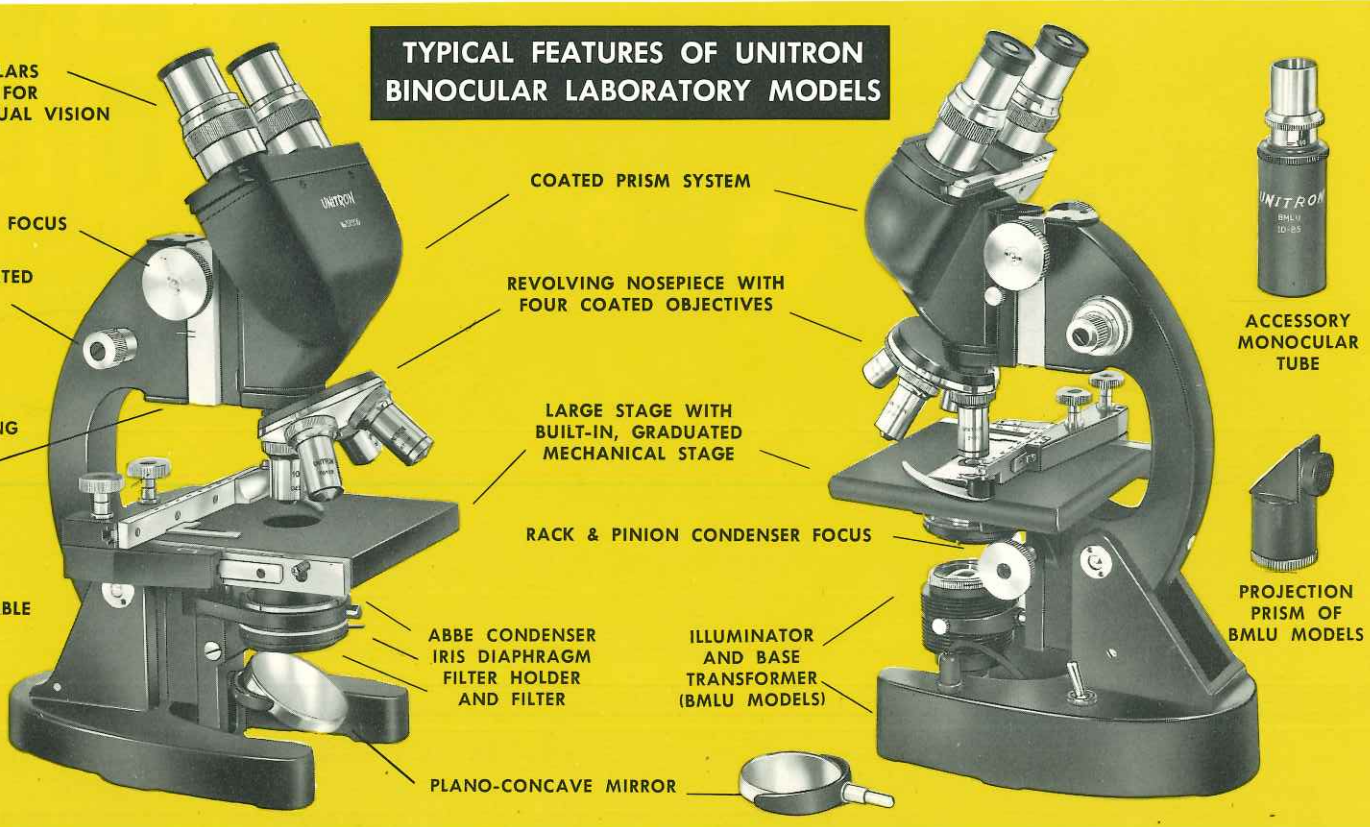
● COMPLETELY EQUIPPED AT BUDGET PRICES

All UNITRON "ML" Microscopes are furnished complete with objectives and eyepieces, mechanical stage, accessories and carrying case. There are really no extras to buy unless an accessory is needed for specialized work. When you buy a UNITRON Laboratory Microscope you benefit both from UNITRON's realistic price policy and from the economy of manufacture possible with the straightforward, classical design. The low budget prices will be welcomed by educational institutions who need to equip a complete laboratory, as well as by the student who has many new expenses to meet during his first year at medical school.

● BACKED BY UNITRON'S PROVEN REPUTATION

Although designed for routine laboratory use, the "ML" Models are constructed with the same precision and durability, and use the same professional-quality optics, as other more elaborate and costly UNITRON models. If you are a student choosing a microscope to use during your educational years and later medical practice, chances are that you will find the research labs at your school using UNITRON instruments for their advanced work. If you are an industrial buyer, you will be in good company: over 80% of the 100 largest industrial firms in the country are UNITRON customers. Like all UNITRON equipment, the "ML" Models are sold with our standard guarantee for quality, workmanship, and performance. Before buying, convince yourself by accepting a 10-day trial without any obligation. You will see for yourself why UNITRON means . . . MORE MICROSCOPE FOR THE MONEY.

TYPICAL FEATURES OF UNITRON BINOCULAR LABORATORY MODELS


BINOCULARS ADJUST FOR INDIVIDUAL VISION
COARSE FOCUS
CALIBRATED FINE FOCUS
SAFETY FOCUSING STOP
INCLINABLE ARM
COATED PRISM SYSTEM
REVOLVING NOSEPIECE WITH FOUR COATED OBJECTIVES
LARGE STAGE WITH BUILT-IN, GRADUATED MECHANICAL STAGE
RACK & PINION CONDENSER FOCUS
ABBE CONDENSER IRIS DIAPHRAGM FILTER HOLDER AND FILTER
ILLUMINATOR AND BASE TRANSFORMER (BMLU MODELS)
PLANO-CONCAVE MIRROR
ACCESSORY MONOCULAR TUBE
PROJECTION PRISM OF BMLU MODELS

UNIVERSITY, MEDICAL, and INDUSTRIAL LABORATORY

FEATURES OF "ML" SERIES LABORATORY MODELS

A microscope is no better than its objective lenses. The coated, achromatic objectives used in the "ML" Series are of research quality, parfocal and parcentered, and mounted in a revolving nosepiece for rapid interchange. Magnifications are 10X (N.A. 0.25), 40X (N.A. 0.65) and 100X (N.A. 1.25) oil immersion, with a 4X (N.A. 0.15) scanning lens supplied, in addition, on binocular and 4-objective monocular models. To insure highest contrast, eyepieces and prisms, as well as objectives, are coated.

All models offer a heavy duty, coarse focusing mechanism with dovetail slideways and diagonal-cut rack gear. Tension is adjustable to individual preference. The precision fine focus assembly responds to the slightest touch and gives a full 2mm. of travel.

The Abbe substage condenser is focused by a rack and pinion and is divisible to allow optimum illumination of large tissue sections. An iris diaphragm controls depth of field and image contrast. The standard condenser is easily removed to allow use of darkfield and other specialized types. A plano-concave mirror is supplied with all (including Auto-Illumination) models. A mechanical stage is standard equipment and accommodates 2" x 3", and smaller, slides. The mechanism detaches for hand scanning. The stage size is ample for the largest sections.

A fitted wooden cabinet, with lock and key, carrying handle, and storage racks for optics, is furnished at no additional cost. Other standard accessories include a plastic dustcover, stage clips, daylight blue filter, immersion oil, and dustproof containers for the objective lenses. UNITRON Laboratory Microscopes are of durable all-metal construction, with components individually machined (rather than die-cast) to guarantee the utmost in precision craftsmanship. The stand is attractively finished in chromium and wear-resistant, baked, black enamel. The professional appearance inspires pride of ownership and harmonizes with the furnishings of the most modern laboratory.

SPECIAL FEATURES OF MONOCULAR MODELS

Monocular Models are available with either three or four objective lenses. Even in the 3-objective models, a quadruple nosepiece is supplied to allow a scanning lens to be added in the future. The mechanical stage is of the detachable type. The condenser has a numerical aperture of 1.2. The monocular body is fitted with an adjustable, calibrated drawtube to simplify measurements made with micrometer reticles and to allow the tube length to be adjusted for optimum optional definition even when using coverglasses of non-standard thickness.

SPECIAL FEATURES OF BINOCULAR MODELS

Inside the binocular body, the coated prism system is mounted in a specially designed frame which holds and insures perfect and permanent alignment. The eyepiece tubes, inclined at a comfortable 30° angle, have both an interpupillary distance and a diopter adjustment. Each user is assured of comfortable viewing, irrespective of the requirements of his individual vision.

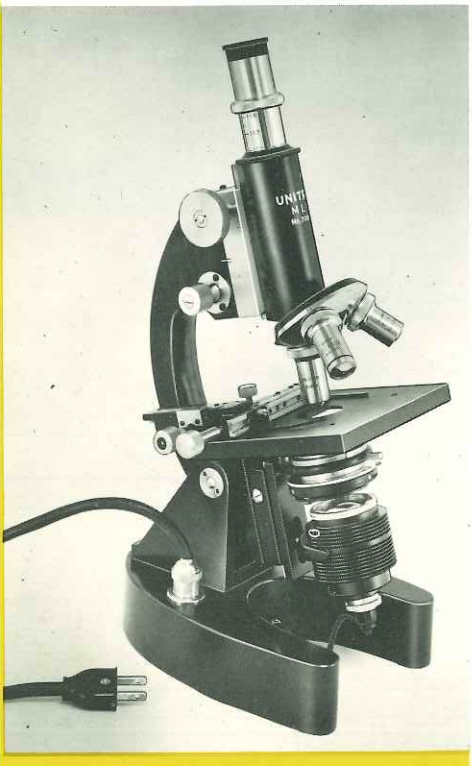
An accessory monocular body, with graduated drawtube, is included as standard equipment for photography, projection, and critical measuring applications.

All four objectives are supplied as standard equipment with binocular models. The mechanical stage is of the built-in type, with the slide holder detachable for hand scanning. Stage motions are graduated and read to 0.1 mm. with verniers. The fine focusing mechanism features a drum calibrated in units of 2 microns (0.002 mm.) to allow measurement of specimen thickness. In binocular models, the substage condenser has a high numerical aperture of 1.4.

SPECIAL FEATURES OF AUTO-ILLUMINATION MODELS

Auto-Illumination Models use a high-intensity, low voltage (7 volt) bulb which operates from a transformer conveniently housed in the microscope base. The lamp with its condensing lens provides brilliant, uniform, full-field illumination to a degree impossible to obtain with less elaborate substage lamps using 115 volt bulbs. A switch in the microscope base gives a choice of two intensities. The well-ventilated, finned housing is mounted on a fork and may be tilted to provide oblique illumination. For optical daylight use, or for work with external illuminators, the lamp may be detached and replaced by the plano-concave mirror included as standard equipment. The 115 volt line cord easily unplugs from the base when not required.

In addition to its convenience for visual observation, the Auto-Illumination feature is of great value for photomicrography and projection. An eyepiece projection prism is furnished with Auto-Illumination Models (with the exception of the ZOOM types). The prism converts the instrument into an effective, self-contained, small projector, useful for viewing by small groups and for projecting an image on paper for tracing.



AUTO-ILLUMINATION
MONOCULAR MODEL MLU

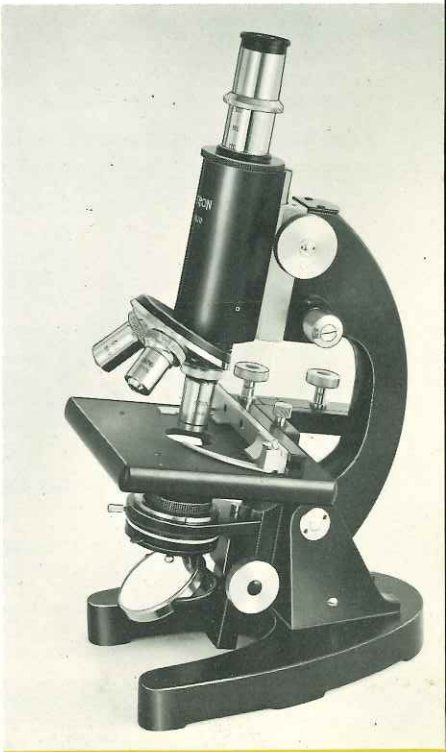
Choice of Widefield or Huygens Eyepieces

ZOOM Available with Monocular Models

Both monocular and binocular models are available with the UNITRON WF10X Widefield Eyepiece. This ocular combines the advantages of a large field of view — usually obtainable only with a 5X eyepiece — and the higher magnification needed for critical observations. The back of the eyepiece contains a special cell for holding reticles, with provision for focusing the scale for individual vision.

Alternately, both monocular and binocular models can be supplied with Huygens 5X and 10X eyepieces. Still other eyepiece combinations can be furnished if needed to meet medical school requirements. Accessory 15X and 20X eyepieces for higher magnifications are available.

Buyers of monocular models may select UNITRON's ZOOM Eyepiece as standard equipment. This remarkable eyepiece provides continuous eyepiece magnification in the range of 10X thru 20X by a mere turn of the zoom collar. Not only does the UNITRON ZOOM Eyepiece replace four standard oculars — 10X, 12.5X, 15X, 20X — but it also gives extra in-between powers that were never before available. The image remains in focus as you zoom upward to study fine detail or downward to bring a larger area of the specimen into view. Although the ZOOM Eyepiece cannot be used in the binocular mechanism, it can be accommodated by the accessory monocular tube included with all binocular models and is listed under additional accessories.



STANDARD
MONOCULAR MODEL MLK

SUMMARY AND PRICE LIST FOR UNITRON LABORATORY-MEDICAL MODELS

SPECIFICATIONS FOR MONOCULAR MICROSCOPES

FOR STANDARD AND AUTO-ILLUMINATION MODELS: Large stand, inclinable 90°; adjustable, graduated drawtube; quadruple revolving nosepiece. Coarse focusing by diagonal-cut rack and pinion; fine focusing by micrometer screw. Divisible Abbe condenser (N.A. 1.2) focusable by rack and pinion; iris diaphragm; filter holder; plano-concave mirror. Large stage with ungraduated, detachable mechanical stage. Built-in safety focusing stop.

Objectives: for 3-objective models — parfocal, achromatic, 10X, 40X, 100X oil immersion; for 4-objective models — 4X objective in addition.

Eyepieces: choices as indicated below. Coated optics.

Accessories: fitted wooden cabinet and dustcover; filter; stage clips; immersion oil.

FOR AUTO-ILLUMINATION MODELS ONLY: As above, but with built-in, low-voltage illuminating system with base transformer; 6 bulbs. Projection prism included with all except Zoom models.

PRICE LIST: STANDARD MONOCULAR MICROSCOPES

MLK-WF:	Widefield WF10X eyepiece, 3 objectives	**$194**
MLKA-WF:	Widefield WF10X eyepiece, 4 objectives	$202
MLK-ZM	ZOOM (10X-20X) eyepiece, 3 objectives	207
MLKA-ZM:	ZOOM (10X-20X) eyepiece, 4 objectives	215
MLK-HG:	Huygens 5X, 10X eyepieces, 3 objectives	191
MLKA-HG:	Huygens 5X, 10X eyepieces, 4 objectives	199

ACCESSORY ILLUMINATOR, LHC: STANDARD models can be supplied with the UNITRON 110 volt substage illuminator in place of the plano-concave mirror at an additional cost of $7.00.

PRICE LIST: AUTO-ILLUMINATION MONOCULAR MODELS

MLU-WF:	Widefield WF10X eyepiece, 3 objectives, proj. prism	**$223**
MLUA-WF:	Widefield WF10X eyepiece, 4 objectives, proj. prism	$231
MLU-ZM:	ZOOM (10X-20X) eyepiece, 3 objectives	232
MLUA-ZM:	ZOOM (10X-20X) eyepiece, 4 objectives	240
MLU-HG:	Huygens 5X, 10X eyepieces, 3 objectives, proj. prism	220
MLUA-HG:	Huygens 5X, 10X eyepieces, 4 objectives, proj. prism	228

GRADUATED MECHANICAL STAGE: Both the Standard and Auto-Illumination Models can be supplied with the mechanical stage graduated (and with verniers) at an additional cost of $6.00.

SPECIFICATIONS FOR BINOCULAR MICROSCOPES

FOR STANDARD AND AUTO-ILLUMINATION MODELS: Large stand, inclinable 90°; with binocular body; quadruple revolving nosepiece. Coarse focusing by diagonal-cut rack and pinion; fine focusing by micrometer mechanism, calibrated in 2 micron units. Divisible Abbe condenser (N.A. 1.4) focusable by rack and pinion; iris diaphragm; filter holder; plano-concave mirror. Large stage with built-in, graduated mechanical stage. Built-in safety focusing stop.

Objectives: parfocal achromatic, 4X, 10X, 40X, 100X oil immersion.

Eyepieces: choices as indicated below. Coated optics.

Accessories: fitted wooden cabinet and dustcover; monocular body with adjustable, graduated drawtube; filter; stage clips; immersion oil.

FOR AUTO-ILLUMINATION MODELS ONLY: As above, but with built-in, low voltage illuminating system with integral base transformer; 6 bulbs; eyepiece projection prism.

PRICE LIST: STANDARD BINOCULAR MICROSCOPES

BMLK-WF:	Paired, Widefield WF10X eyepieces	**$391**
BMLK-HG:	Paired, Huygens 5X and 10X eyepieces	$385

PRICE LIST: AUTO-ILLUMINATION BINOCULAR MODELS

BMLU-WF:	Paired, Widefield WF10X eyepieces, proj. prism	**$420**
BMLU-HG:	Paired, Huygens 5X and 10X eyepieces, proj. prism	$414

ADDITIONAL ACCESSORIES AVAILABLE FOR ML MODELS INCLUDE

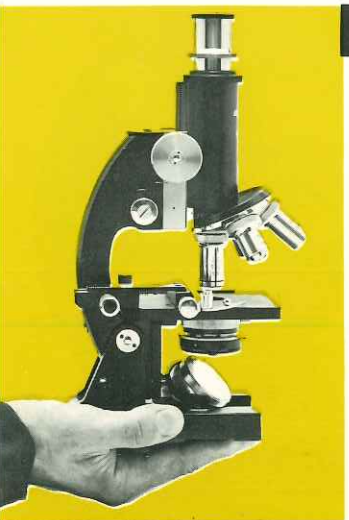
Darkfield condenser, cardioid-type	$39.50
P15X eyepiece, periplan type for monocular models	7.00
Bi-P15X eyepieces, periplan type for binocular models	14.00
ZOOM Eyepiece for monocular tubes	24.50
Micrometer disc (0.1mm.), measures 1 micron with 100X objective	5.75

A time payment plan is available to qualified individuals. Information on request.

PHASE LABORATORY AND MEDICAL AUTO-ILLUMINATION

The UNITRON Laboratory PHASE Models offer all the features of the brightfield Microscopes plus the added advantages of phase and darkfield. There is continuous transition between the different types of microscopy. The popular prices of these models make them ideal for general laboratory and medical use. Request Catalog MP.

Prices quoted are f.o.b. Newton and are subject to quantity discounts.



UNITRON PORTABLE MEDICAL and LABORATORY MICROSCOPE

Here is a completely equipped medical and laboratory type microscope with all the optical and mechanical features of standard models — and with the added advantage of portability.

The medical student whose studies require the use of a microscope both at school and at home will welcome the ease with which UNITRON Model MLP may be transported. The complete instrument housed in its cabinet weighs only 8½ lbs. and is about the size of Gray's *Anatomy*. Throughout his later career as a practicing physician, the student will find the UNITRON Portable Model invaluable for on-the-spot diagnosis in cases where there is no time to obtain a lab report.

Research workers in biology and botany who do field work will also appreciate the advantage of being able to use a truly professional instrument rather than being restricted by the limitations of a "pocket" microscope. For it should be emphasized that exactly the same results are achieved with UNITRON Model MLP as with models using a larger stand; in fact, the objective lenses, eyepieces, tube length, condenser aperture, field of view, magnifications etc. are exactly the same as used in the standard-sized models. To achieve portability, nothing has been changed but the size of the stand.

SPECIFICATIONS

Portable stand with inclinable arm and calibrated drawtube. (Overall dimensions with drawtube extended: 10″ x 5″ x 3″). Objectives: Four coated achromatic objectives; 4X, 10X, 40X, 100X. Coarse focusing by rack and pinion, fine focusing by micrometer screw. Focusable Abbe condenser (N.A. 1.2) with iris diaphragm; filter holder; plano-concave mirror. Detachable mechanical stage with travel 23X30 mm. Fitted wooden carrying case with handle, lock and keys. Accessory filter, stage clips, dustcover, immersion oil.

MLP-WF, with Widefield WF10X eyepiece	**$211**
MLP-ZM, with ZOOM (10X-20X) eyepiece	$224
MLP-HG, with Huygens 5X and 10X eyepieces	208

Printed in U.S.A.

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